

Application No.: 10/598,053
Amendment Dated September 2, 2010
Reply to Office Action of June 2, 2010

REMARKS

This amendment is submitted in reply to the Office Action dated June 2, 2010. Claims 3, 8, 9, 16-19, 22, 26 and 29-31 currently stand rejected. Applicants appreciate the Examiner's indication that claims 2, 5-7, 10, 11, 15, 27 and 28 include allowable subject matter and would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Applicants have amended claims 2, 5, 10, 15 and 27 to place them in the form of independent claims including all of the limitations of their respective base claims (claim 22 in each case) and any intervening claims. These claims are now therefore allowable. Dependent claims 6, 7, 11 and 28 depend from claim 5, 10 and 27, respectively, and are therefore patentable at least by virtue of their dependence from patentable independent claims. Claim 14 has been canceled, without prejudice. No new matter has been added by the amendment. Claims 12, 13, 20 and 21 are previously withdrawn due to a restriction requirement. Claims 1, 4 and 23-25 have been previously canceled.

In light of the amendment and the remarks presented below, Applicants respectfully request reconsideration and allowance of all now-pending claims of the present application.

Claim Objections

Claim 14 has drawn objection as being duplicative of claim 22. Applicants have canceled claim 14 and therefore the objection to claim 14 is now moot.

Claim Rejections - 35 USC § 103

Claims 3, 8, 9, 16-19, 22, 26 and 29-31 currently stand rejected under 35 U.S.C. §103(a), as being unpatentable over Spies (DE 19621886) in view of either Lee (U.S. Patent No. 7,482,803) or Tapson U.S. Patent No. 7,321,229. Applicants respectfully traverse.

Independent claim 22 recites, *inter alia*, a processing circuit operable to process sensor signals generated in the one or more sensor windings which are at substantially the same frequency as said excitation frequency, to determine a value of a ratiometric function, which value is indicative of the relative position between the first and second relatively movable

members. Applicants respectfully submit that the cited references, alone or in combination, fail to teach or suggest this feature and specifically fail to teach or suggest the processing of sensor signals generated in the one or more sensor windings, which are at substantially the same frequency as said excitation frequency, to determine a value of a ratiometric function.

Spies describes a “flux gate” type of position encoder. An inherent property of an encoder of this type is that the signals that are processed by the processing electronics are at twice the frequency of the excitation signal. The Office Action supports the allegation that Spies discloses the above recited feature of independent claim 22 by referencing “58 and the first sentence of the abstract”. However, element 58 represents a signal generator that generates two signals. One of the signals generated goes to the excitation winding and the other signal generated goes to the processing circuit. Spies fails to provide any disclosure that these two signals are at the same frequency. Moreover, the abstract of Spies also fails to include any statement that the same frequency is used for these two signals.

Instead, as indicated above, an inherent feature of the flux gate sensor of Spies is that the processing circuitry operates at twice the frequency of the excitation frequency. Spies mentions that this application relates to a flux gate sensor and points the reader to EP0191223 for further details of how such fluxgate sensors operate. EP0191223 clearly states on page 3 lines 5 to 14 that the signal generated in the sensor windings of such fluxgate sensors is at twice the frequency of the excitation signal.

In the paragraph bridging pages 4 and 5 of the Office Action, selective quotations from the translation of Spies are provided. The section referred to by the Office Action states that an excitation signal is applied to the excitation coils that produce, as a result, a corresponding high frequency alternating field. However, this is just standard electromagnetic theory - an excitation current applied to a coil generates a corresponding (proportional) magnetic field. Applicants do not dispute that Spies will generate an AC magnetic field at the same frequency. However, before that magnetic field can generate a signal that varies with the position to be measured, it has to interact with the magnetic film and the DC field. When it does this, it causes the film to be driven in and out of saturation which in turn results in the sensor signals being at twice

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the frequency of the excitation signal. As discussed above, this is an inherent property of a flux gate sensor.

Accordingly, Spies fails to teach or suggest the processing of sensor signals generated in the one or more sensor windings, which are at substantially the same frequency as said excitation frequency, to determine a value of a ratiometric function as provided in independent claim 22. Lee and Tapson also fail to teach or suggest the above described feature of independent claim 22 (and are not cited as such) and therefore fail to cure this deficiency of Spies.

Since Spies, Lee and Tapson each fail to teach or suggest the processing of sensor signals generated in the one or more sensor windings, which are at substantially the same frequency as said excitation frequency, to determine a value of a ratiometric function as set forth in independent claim 22, any combination of Spies, Lee and Tapson also fails to teach or suggest such feature. Thus, independent claim 22 is patentable over Spies, Lee and Tapson either alone or in combination.

Claims 3, 8, 9, 16-19, 26 and 29-31 depend either directly or indirectly from independent claim 22, and thus include all of the recitations of their corresponding independent claims. Dependent claims 3, 8, 9, 16-19, 26 and 29-31 are therefore patentable over Spies, Lee and Tapson, alone or in combination, for at least the same reasons given for independent claim 22.

Accordingly, for all of the reasons stated above, Applicants respectfully submit that the rejections of claims 3, 8, 9, 16-19, 26 and 29-31 are overcome.

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CONCLUSION

In view of the amendment and remarks submitted above, it is respectfully submitted that the present claims are in condition for immediate allowance. It is therefore respectfully requested that a Notice of Allowance be issued. The Examiner is encouraged to contact Applicants' undersigned attorney to resolve any remaining issues in order to expedite examination of the present invention.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefore (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 16-0605.

Respectfully submitted,



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